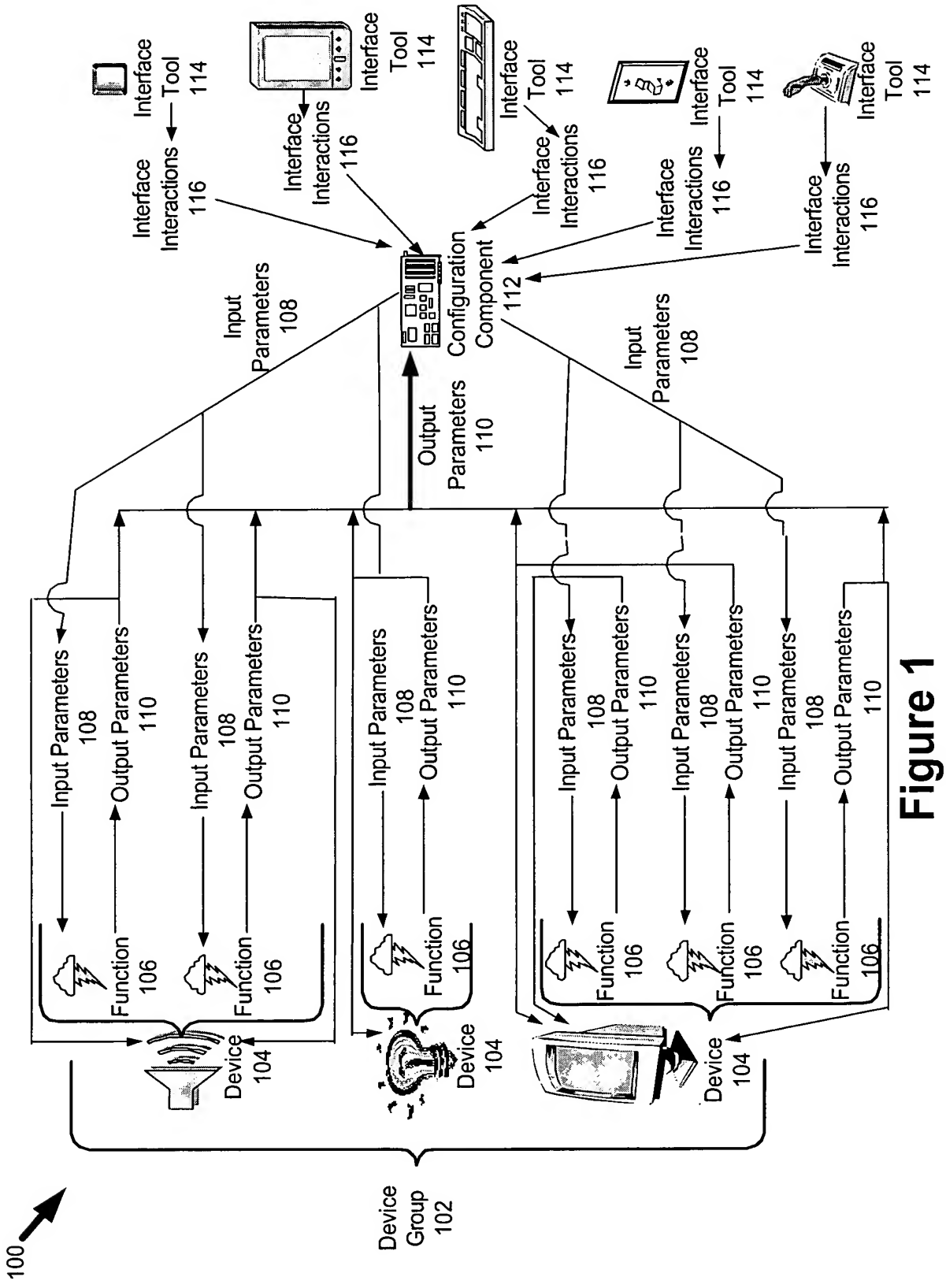

100
Device Group 102
Device 104
Function 106
Input Parameters 108
Output Parameters 110
Configuration Component 112
Interface Tool 114
Interface Interactions 116

Figure 1

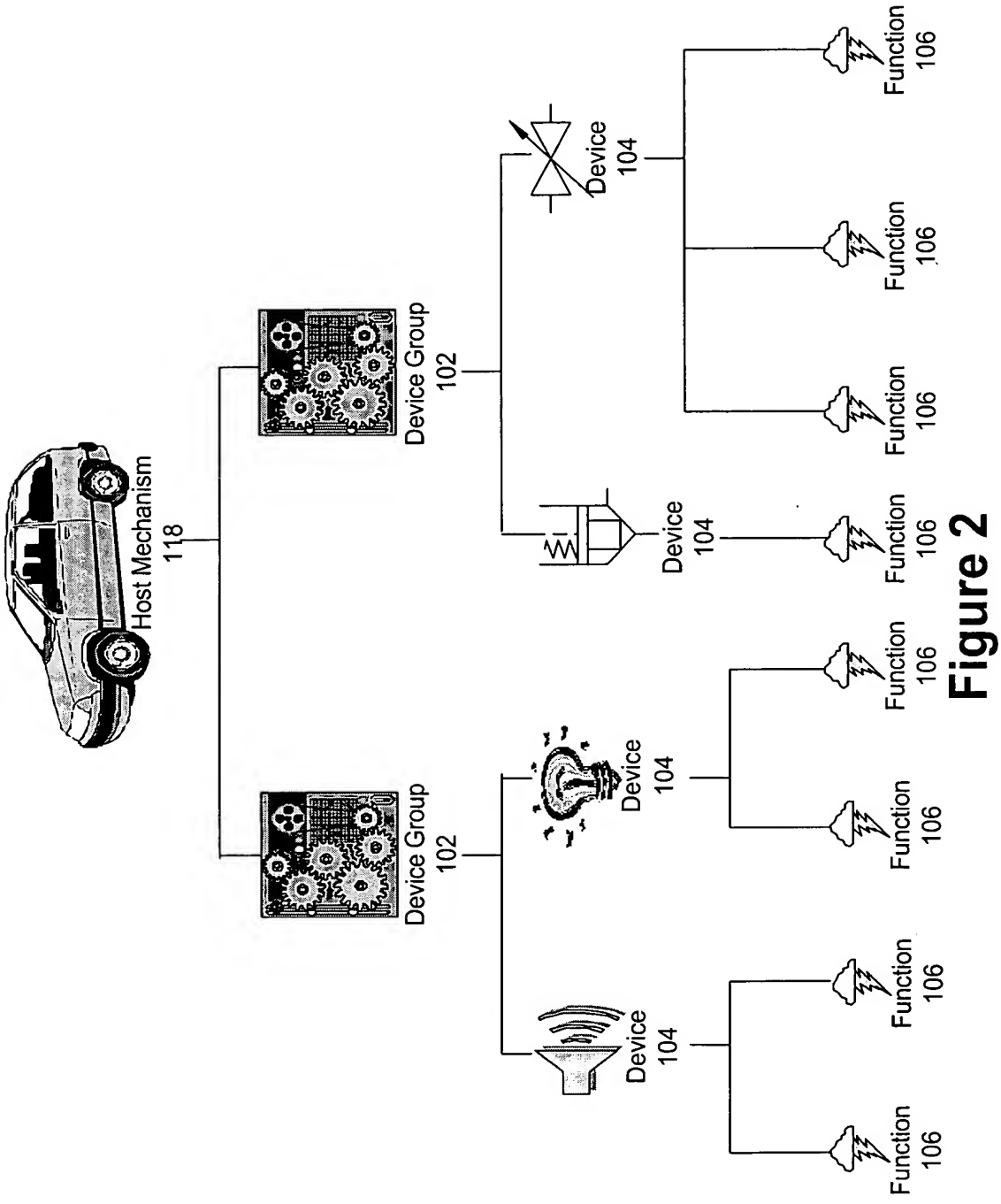

Host Mechanism
118
Device Group
102
Device Group
102
Device
104
Device
104
Device
104
Device
104
Function
106
Function
106
Function
106
Function
106
Function
106
Function
106
Function
106
Function
106
Function
106
Function
106

Figure 2

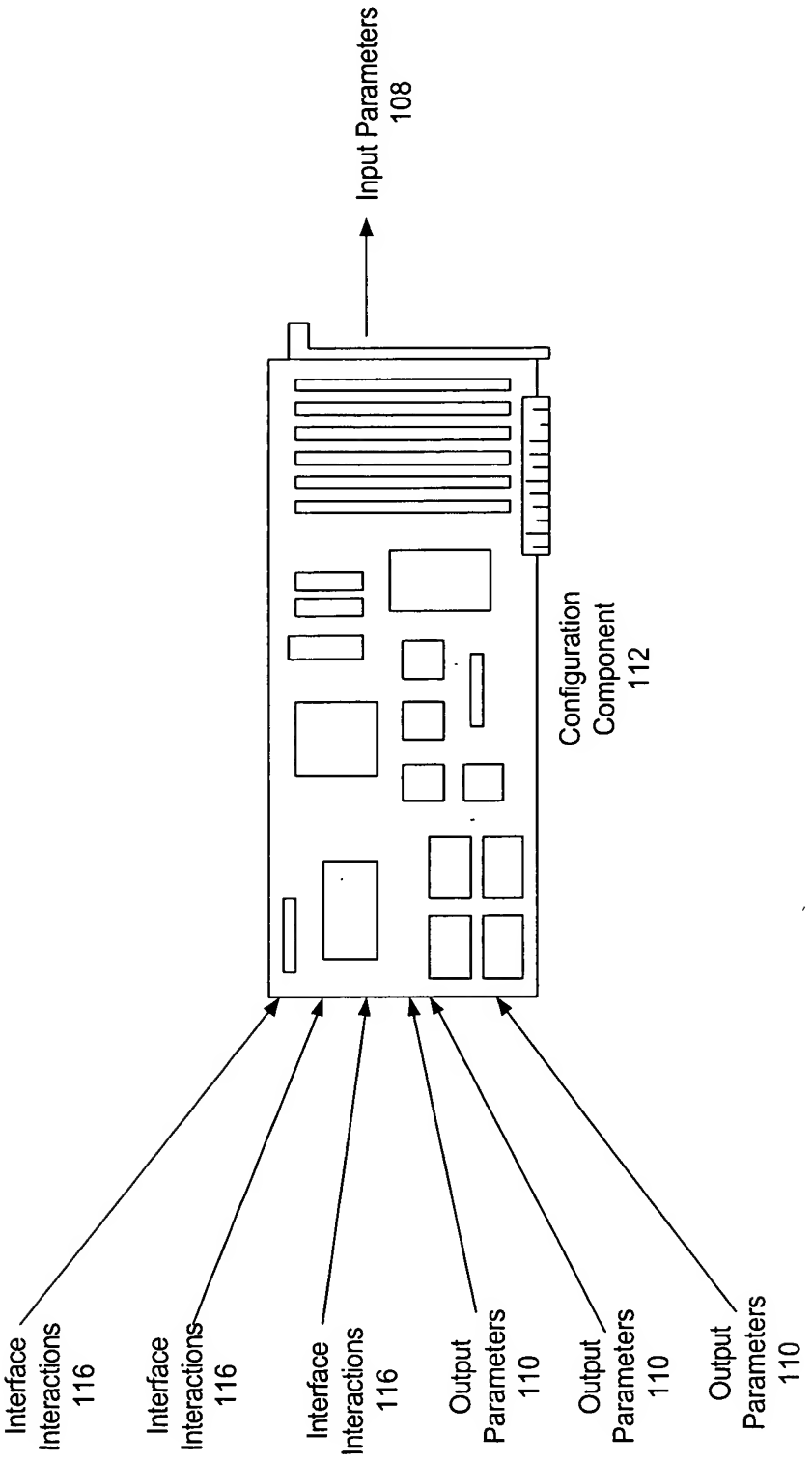

Input Parameters
108
Configuration
Component
112
Interface
Interactions
116
Interface
Interactions
116
Interface
Interactions
116
Output
Parameters
110
Output
Parameters
110
Output
Parameters
110

Figure 3

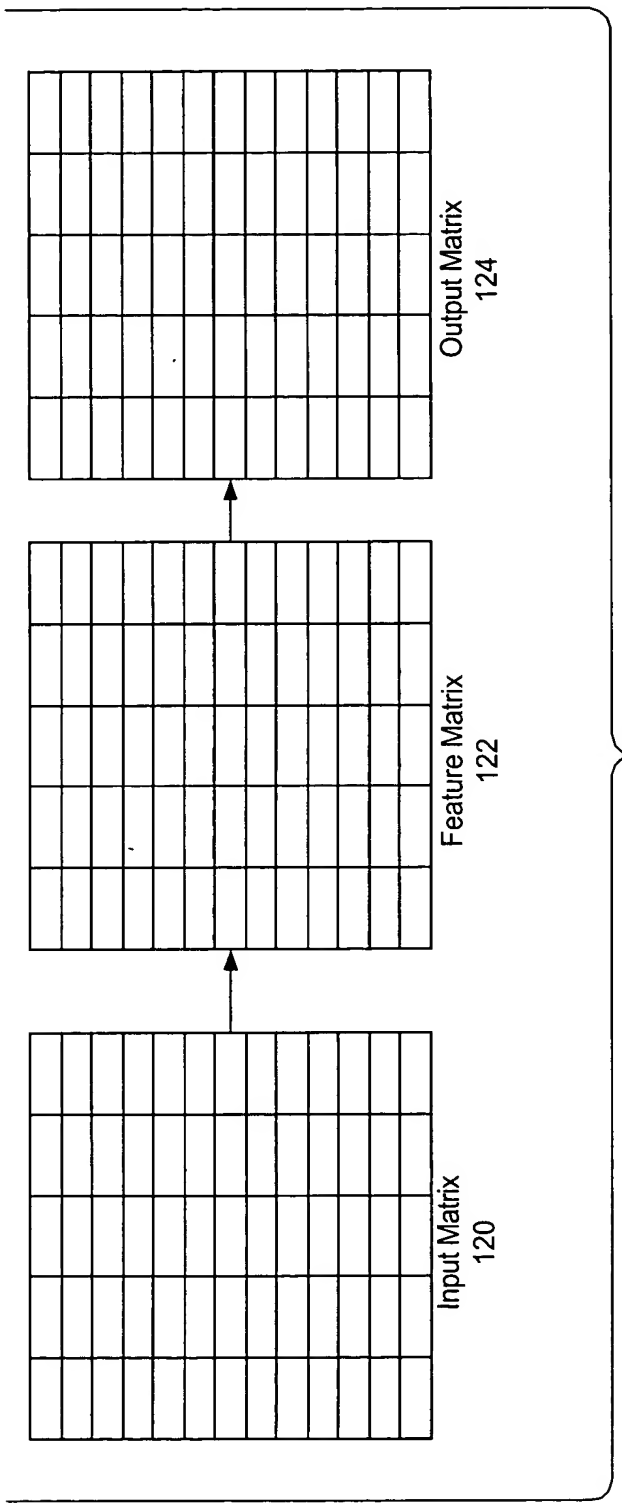

Output Matrix
124
Feature Matrix
122
Input Matrix
120
Configuration
Component
112

Figure 4

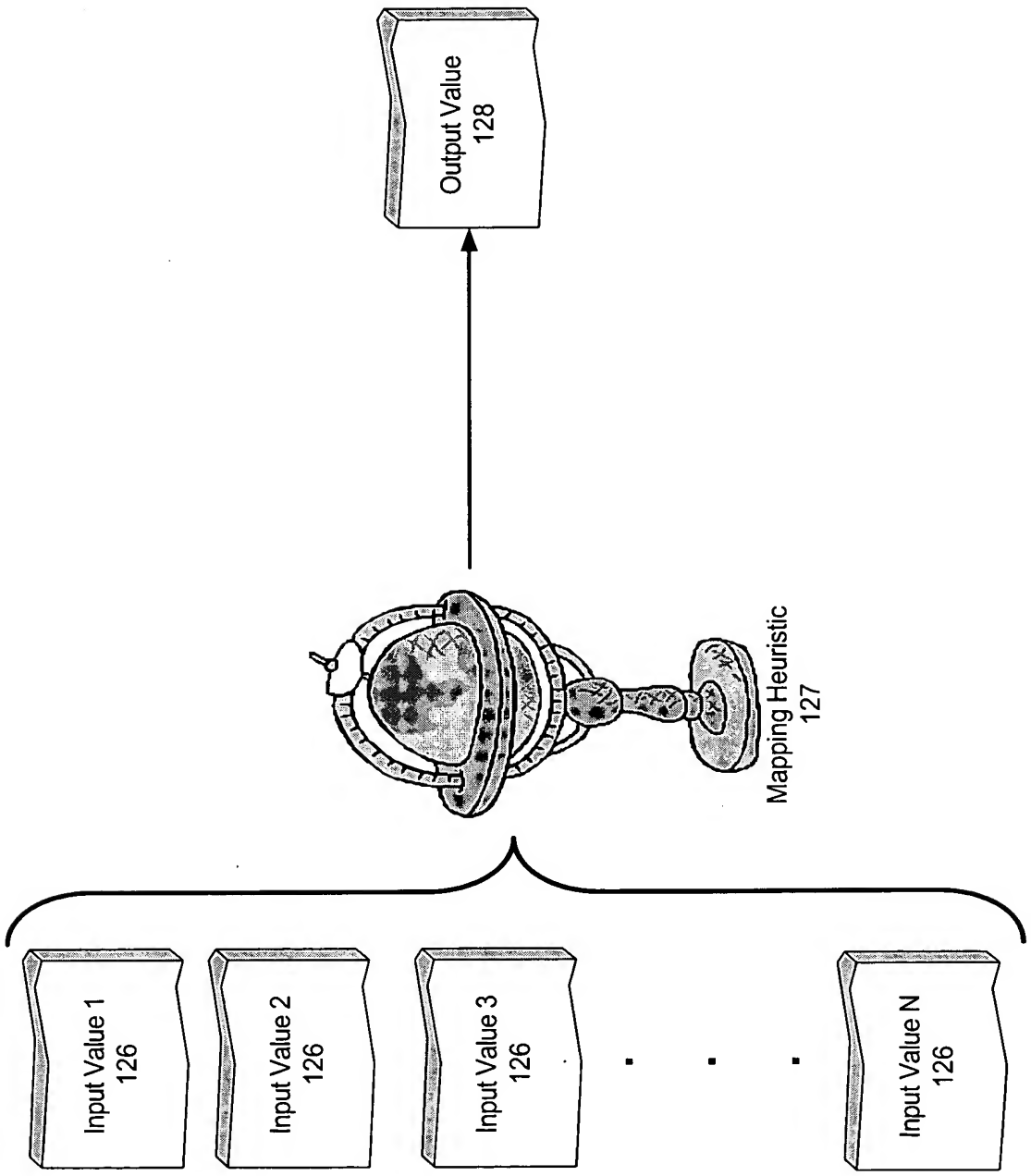

Output Value
128
Mapping Heuristic
127
Input Value 1
126
Input Value 2
126
Input Value 3
126
Input Value N
126

Figure 5

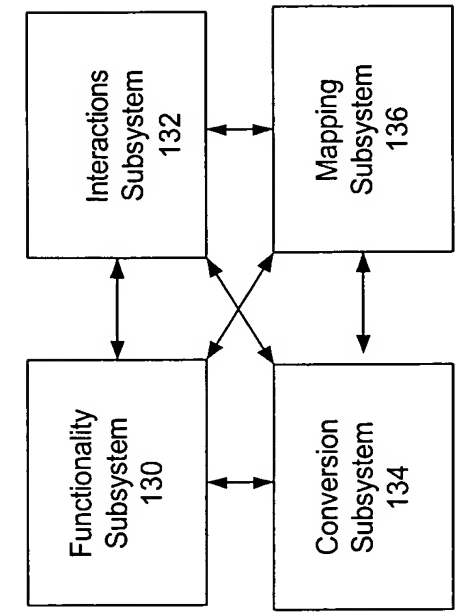


Figure 7

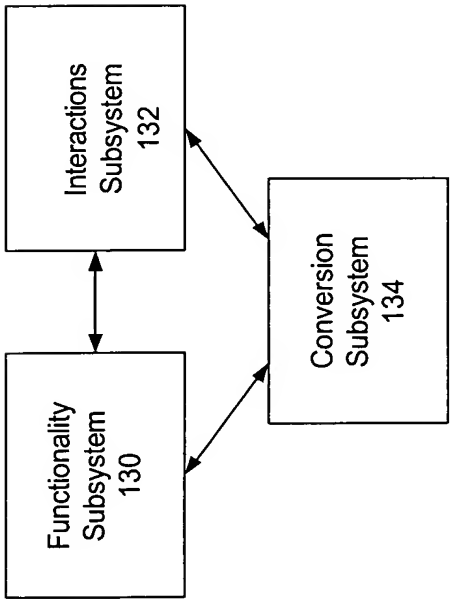


Figure 6

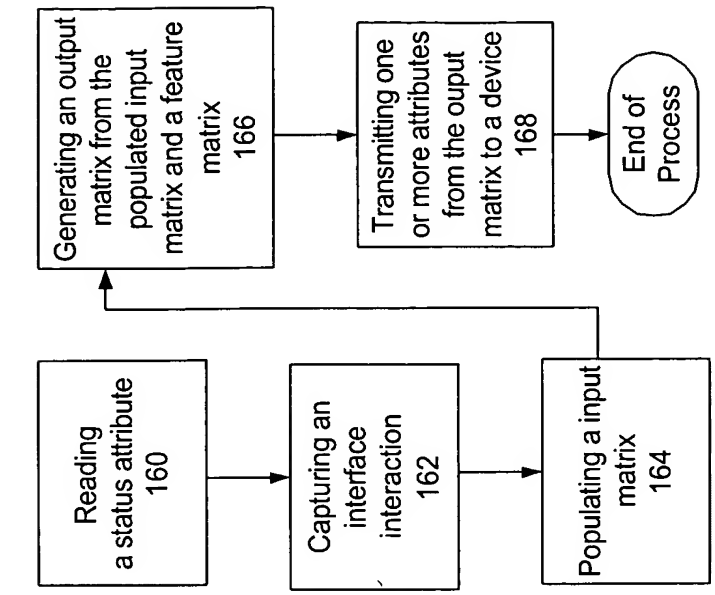


Figure 10

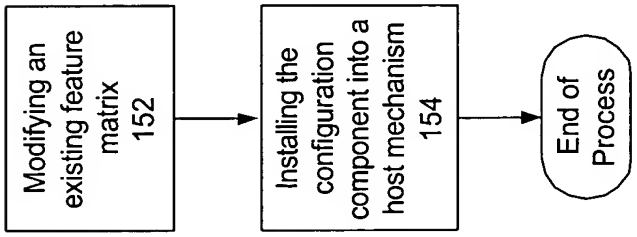


Figure 9

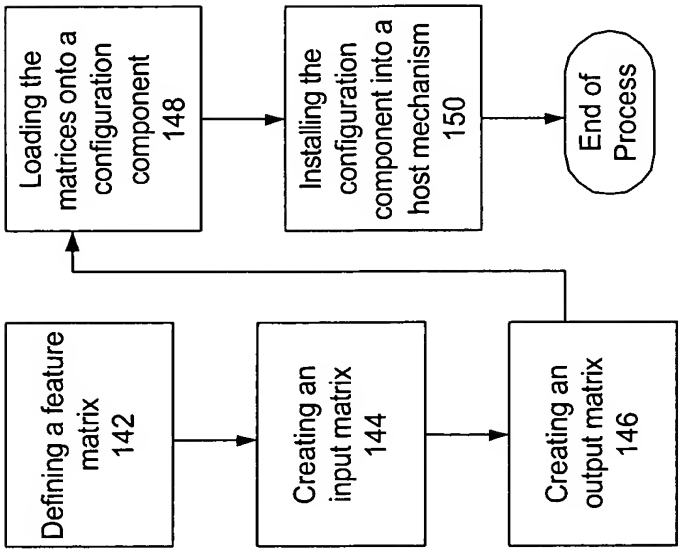


Figure 8

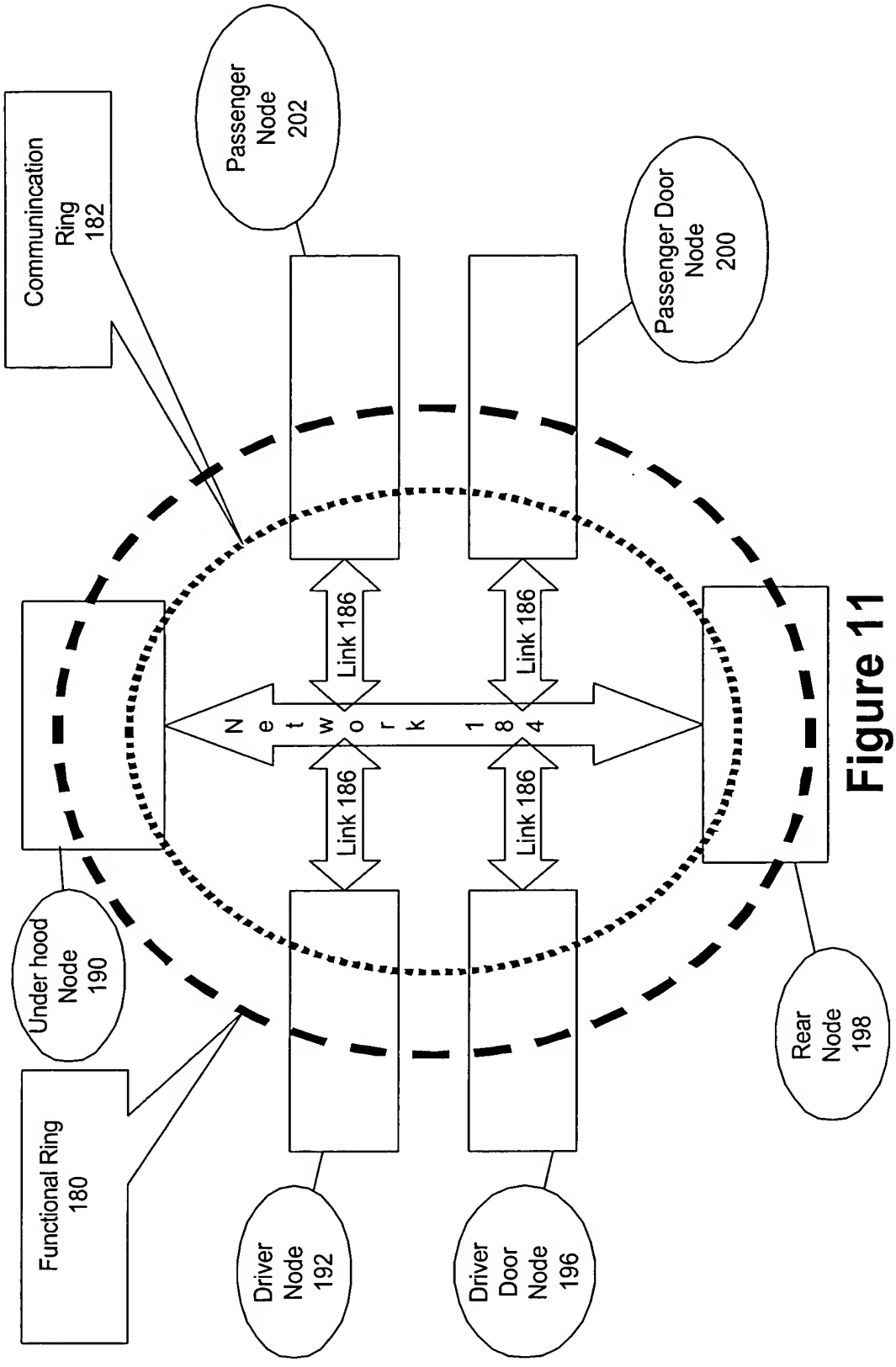

Communincation Ring 182
Passenger Node 202
Passenger Door Node 200
Link 186
Link 186
Network 184
Link 186
Link 186
Under hood Node 190
Functional Ring 180
Driver Node 192
Driver Door Node 196
Rear Node 198

Figure 11

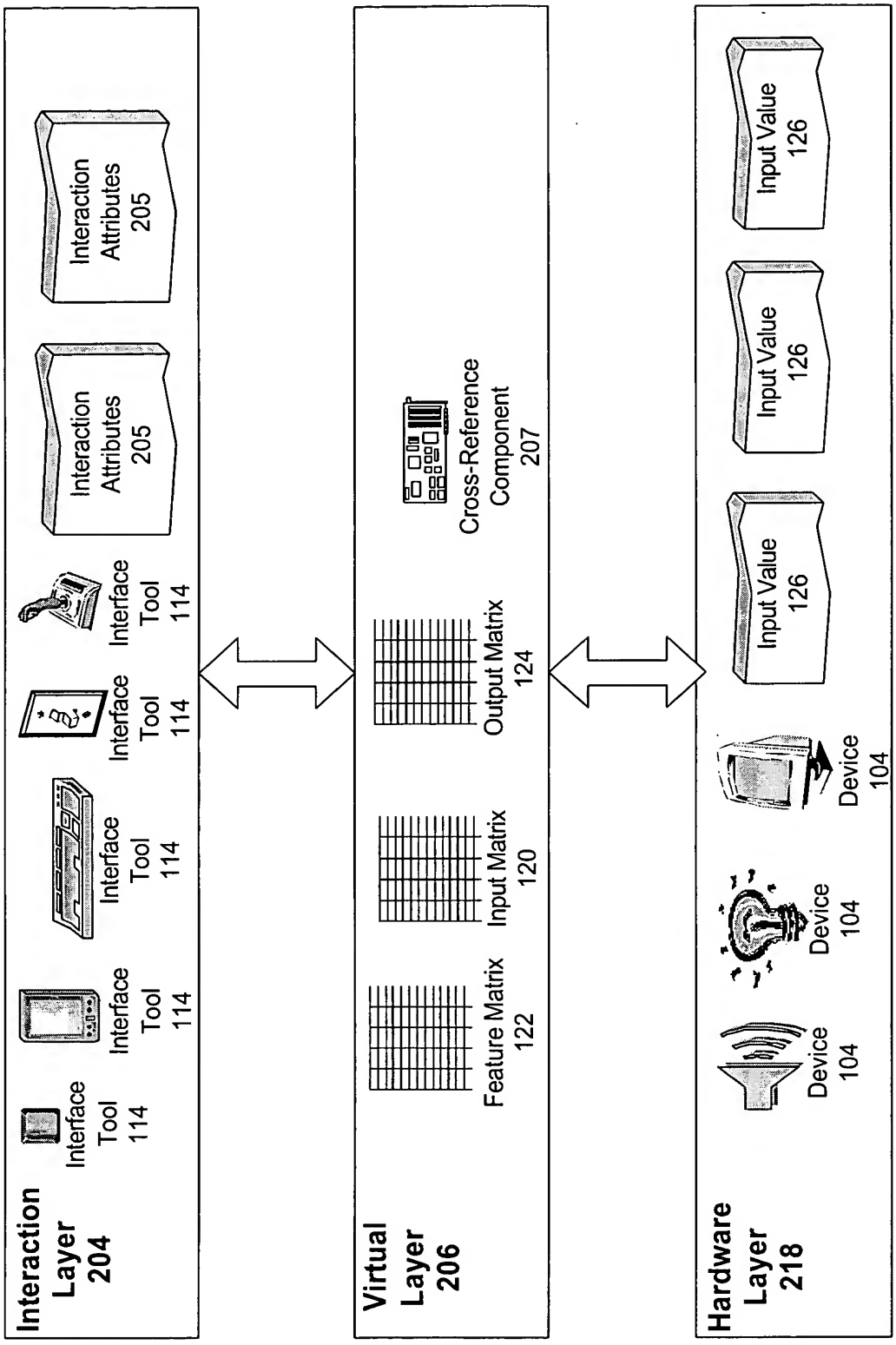

Interaction Layer 204
Interface Tool 114
Interface Tool 114
Interface Tool 114
Interface Tool 114
Interface Tool 114
Interaction Attributes 205
Interaction Attributes 205
Virtual Layer 206
Feature Matrix 122
Input Matrix 120
Output Matrix 124
Cross-Reference Component 207
Hardware Layer 218
Device 104
Device 104
Device 104
Input Value 126
Input Value 126
Input Value 126

Figure 12

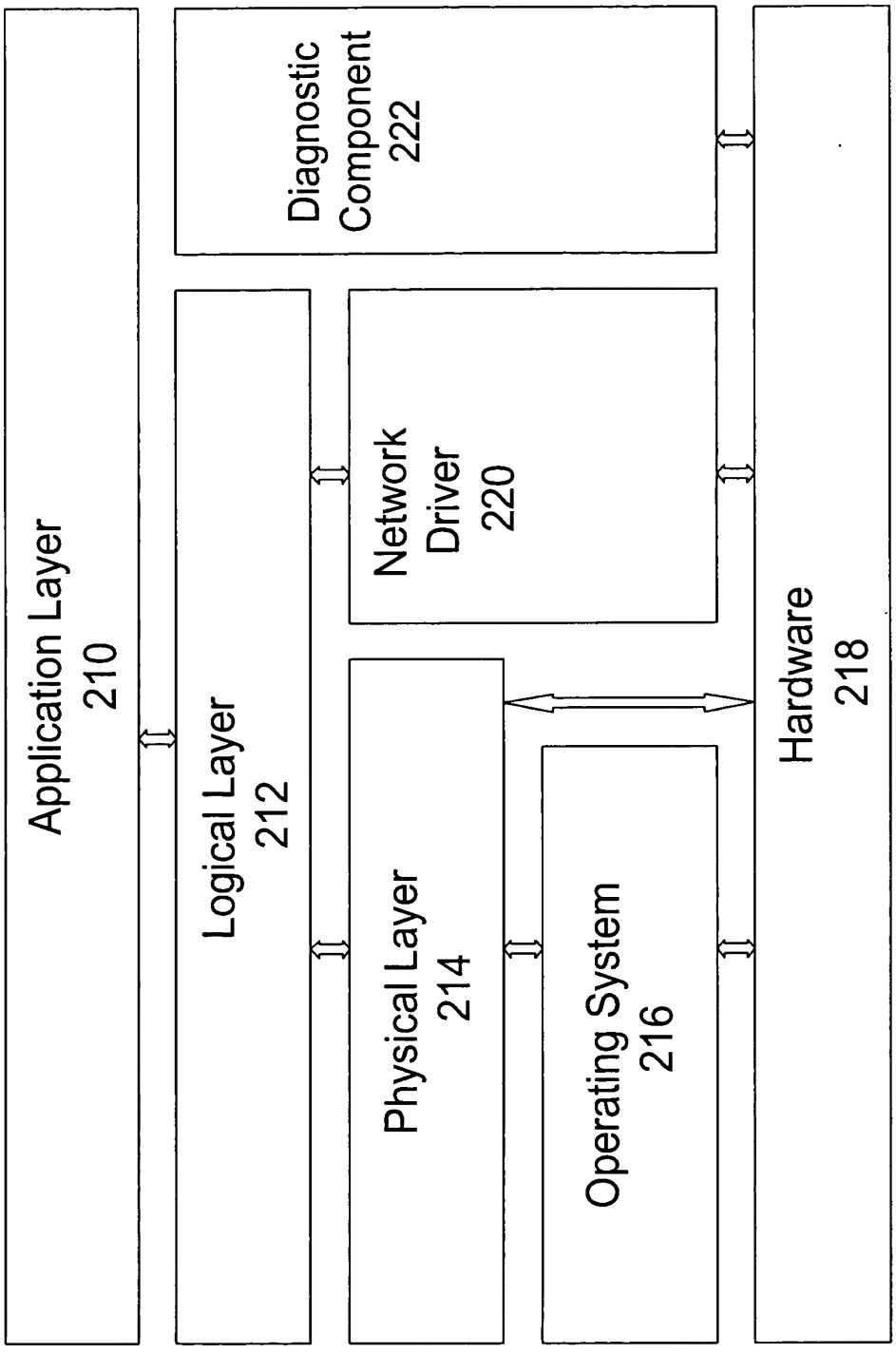

Application Layer
210
Logical Layer
212
Physical Layer
214
Operating System
216
Network
Driver
220
Diagnostic
Component
222
Hardware
218

Figure 13

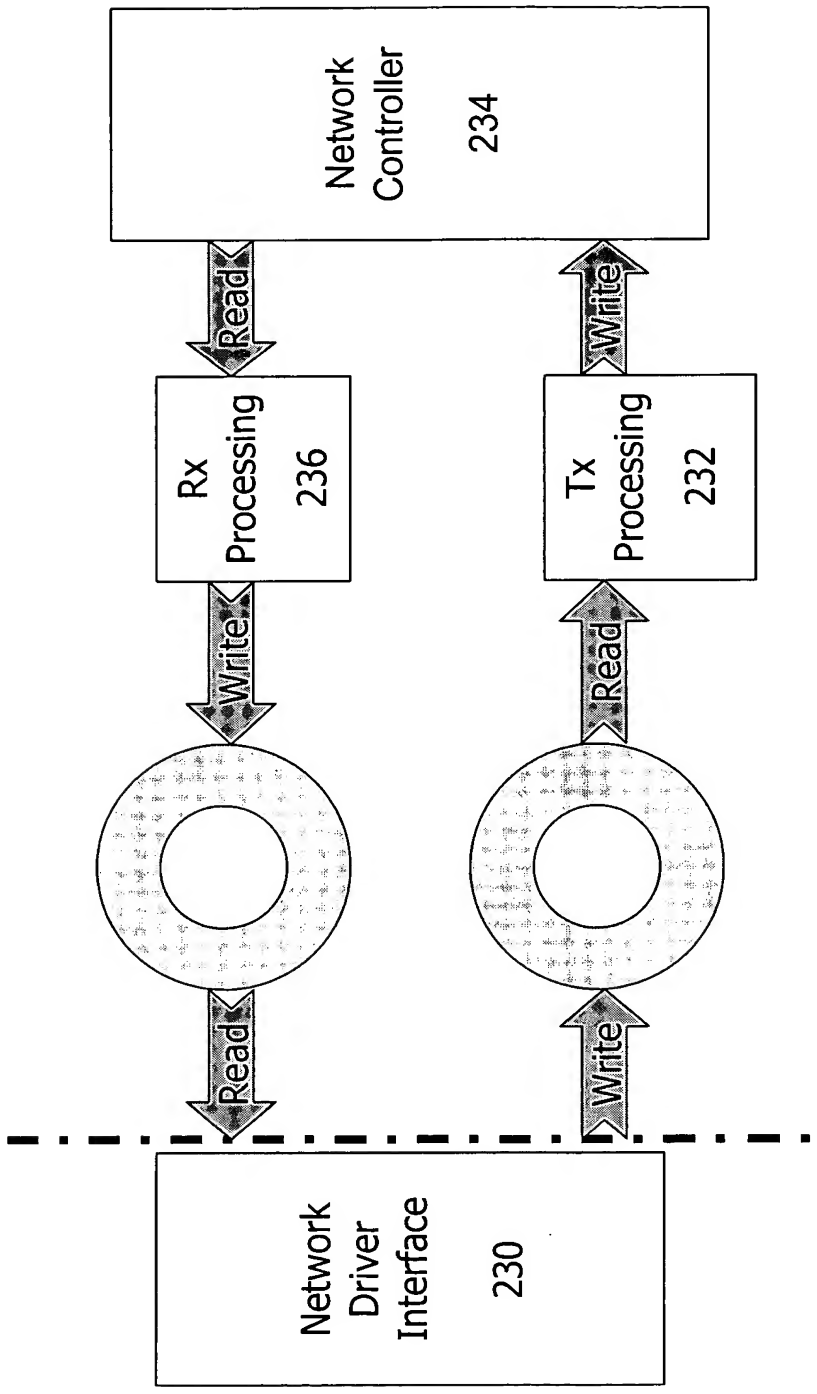

Network Controller 234
Read
Write
Rx Processing 236
Tx Processing 232
Write
Read
Read
Write
Network Driver Interface 230

Figure 14

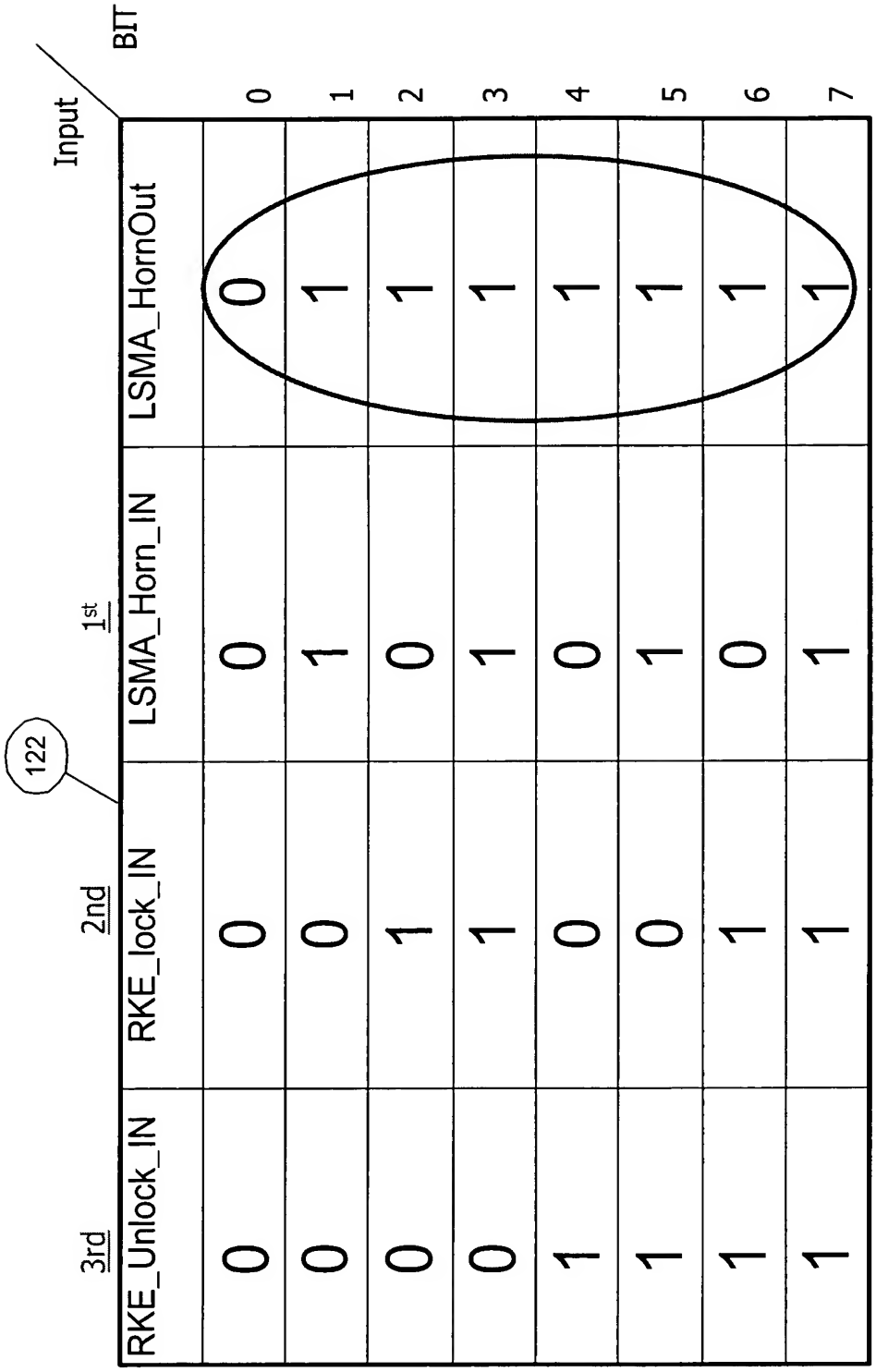

Input
BIT
122
3rd
2nd
1st
RKE_Unlock_IN
RKE_lock_IN
LSMA_Horn_IN
LSMA_HornOut
0 1 2 3 4 5 6 7
0 0 0 1 1 1 1 1
0 0 1 0 1 1 1 1
0 0 0 1 0 1 1 1
0 0 1 1 1 0 1 1
1 0 0 0 0 1 1 1
1 0 1 0 1 0 1 1
1 1 0 1 0 1 1 1
1 1 1 1 1 1 1 1

Figure 15

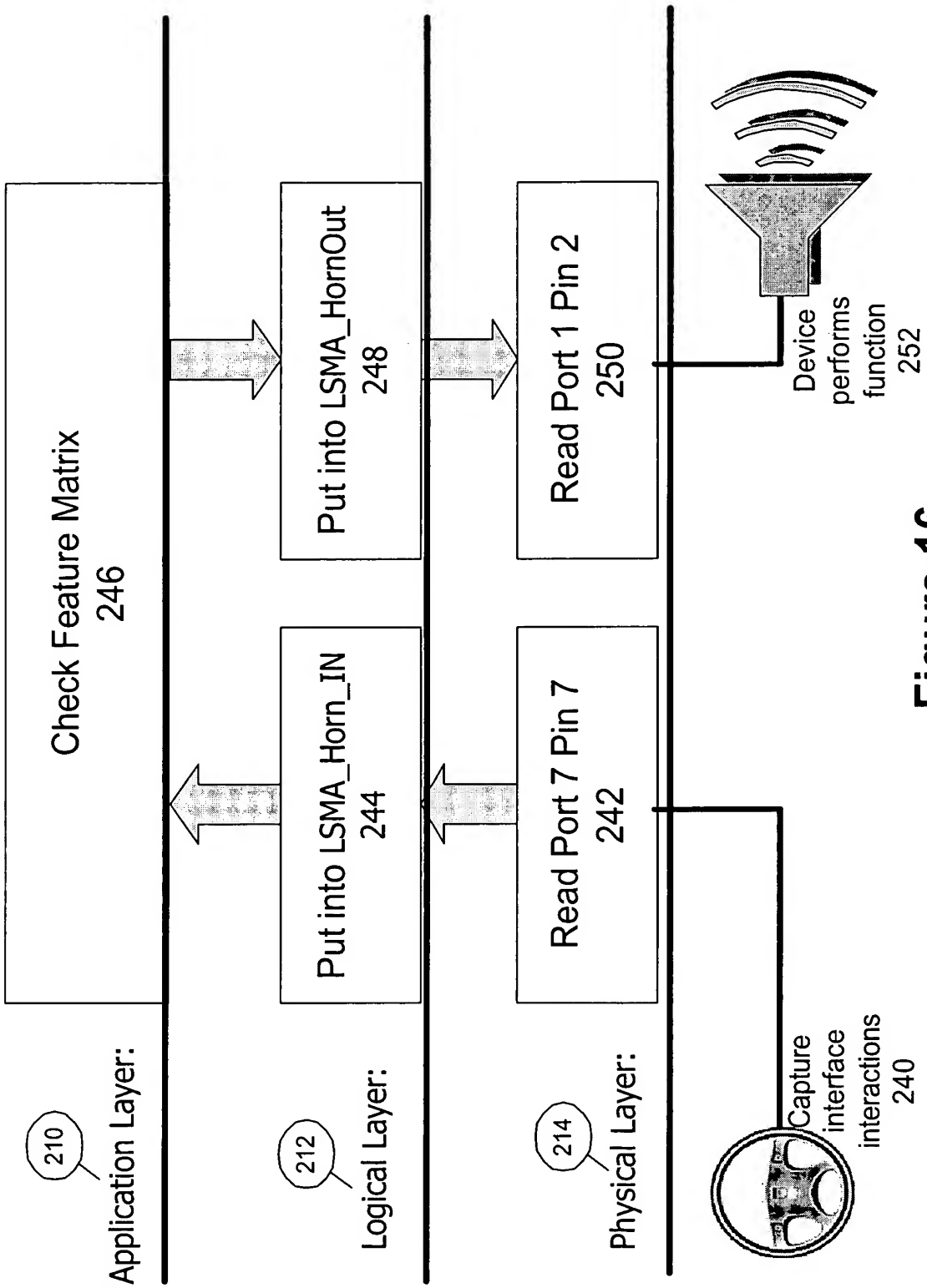
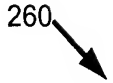
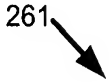

Application Layer:
210
Logical Layer:
212
Physical Layer:
214
Check Feature Matrix
246
Put into LSMA_Horn_IN
244
Read Port 7 Pin 7
242
Put into LSMA_HornOut
248
Read Port 1 Pin 2
250
Capture interface interactions
240
Device performs function
252

Figure 16




```
const PortPinTypeDef DigInPinTbl[TotDigInNum]=
{           /*          Port#       Pin#        Type */
            /*-------------------------------------------------*/
            PinDef(ActLow,7,        7,          Dig_IN_TTL),    /* LSMA_Horn_IN */
            PinDef(ActHigh,9,       0,          Dig_IN_TTL),    /* LSMA_IGN_ACC_IN */
            PinDef(ActHigh,9,       1,          Dig_IN_TTL),    /* LSMA_WasherOn_IN */
            PinDef(ActHigh,9,       4,          Dig_IN_TTL),    /* LSMA_HeadLampOn_IN */
};
```

Figure 17




```
const PortPinTypeDef DigOutPinTbl[TotDigOutNum]=
{           /*          Port#       Pin#        Type */
            /*-------------------------------------------------*/
            PinDef(ActHigh,1,       2,          Dig_OUT_PP),    /*5 LSMA_HornOut */
            PinDef(ActHigh,3,       3,          Dig_OUT_PP),    /*6 LSMA_TrunkRelease */
            PinDef(ActHigh,4,       3,          Dig_OUT_PP),    /*7 LSMA_MF_Power_F12 */
};
```

Figure 18

262

```
/* Input Table(gSmaITable) following name are used by Application layer */
/*-------------------------------------------------------------------------------*/
#define LSMA_Horn_IN                LSMA_LogIn_17
#define LSMA_IGN_ACC_IN             LSMA_LogIn_18
#define LSMA_WasherOn_IN            LSMA_LogIn_19
#define LSMA_HeadLampOn_IN          LSMA_LogIn_20
#define LSMA_Pre_Horn_IN            LSMA_LogIn_21

/* Following is CAN message input */
#define LSMA_DDM_Door_Ajar          LSMA_LogIn_39
#define LSMA_DDM_Pre_Door_Ajar      LSMA_LogIn_40
#define LSMA_DDM_Door_Lock          LSMA_LogIn_41
#define LSMA_DDM_Door_Unlock        LSMA_LogIn_42
#define LSMA_PDM_Door_Ajar          LSMA_LogIn_43
```

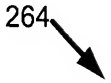
Figure 19

263

```
/* In the output Table(gSmaOTable), following names are owned by Application layer */
/*-------------------------------------------------------------------------------*/
#define LSMA_HornOut                LSMA_LogOut_6
#define LSMA_TrunkRelease           LSMA_LogOut_7
#define LSMA_MF_Power_F12           LSMA_LogOut_8
#define LSMA_Chime_State            LSMA_LogOut_9

/* Delay Index definiton used for  DelayOutIdx[] array */
#define LSMA_Trunk_Release_idx      0       /* the first element in the array */
#define LSMA_Hron_Output_idx        1       /* the first element in the array */
```

Figure 20




```
const BitTbl3In AppTbl2=
{
        BitTbl,
        InputNum3,
        RKE_Unlock_IN,          /* 3rd */
        RKE_lock_IN,            /* 2nd */
        LSMA_Horn_IN,           /* 1st */
        LSMA_HornOut,           /* Output ID */
        /* Bit 7  6  5  4  3  2  1  0 */   /* bit map start from here */
        0xFE,                   /* 1, 1, 1, 1, 1, 1, 1, 0 */
};
```

Figure 21

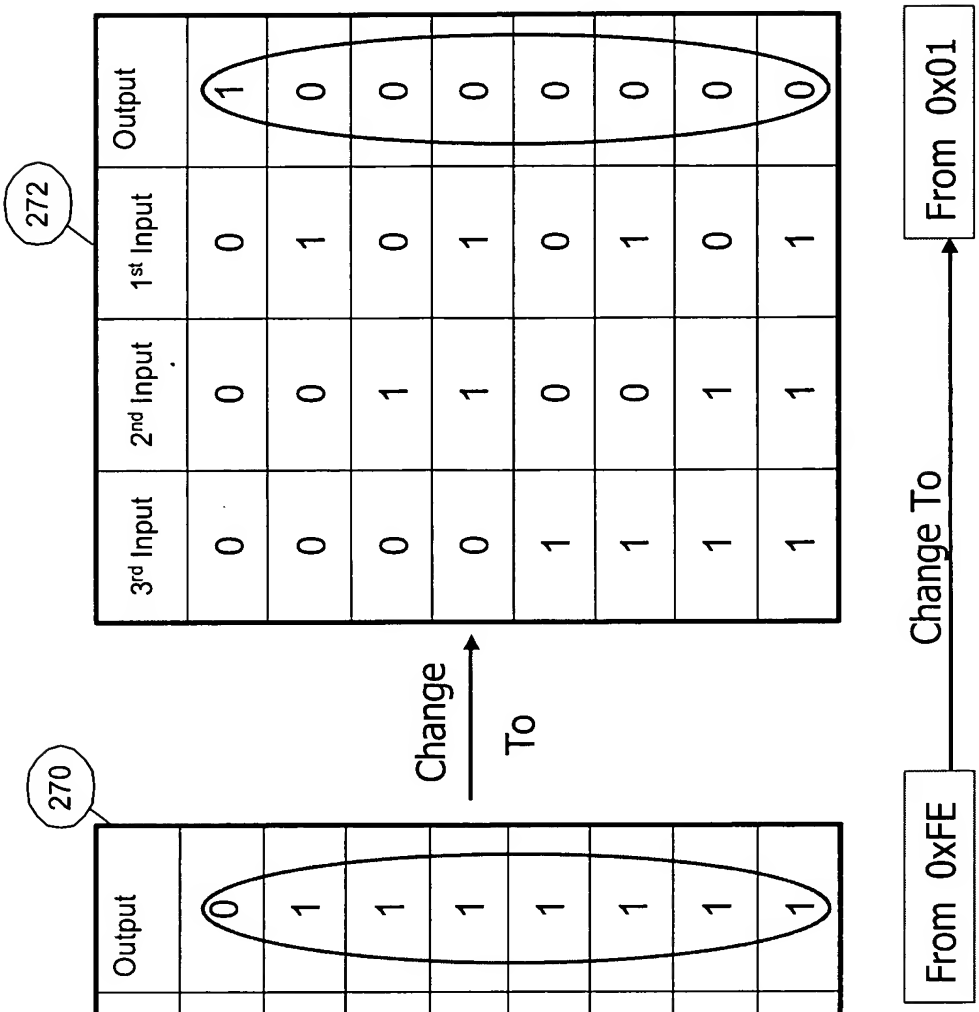

272
3rd Input
2nd Input
1st Input
Output
0 0 0 1
0 0 1 0
0 1 0 0
0 1 1 0
1 0 0 0
1 0 1 0
1 1 0 0
1 1 1 0
Change To
270
3rd Input
2nd Input
1st Input
Output
0 0 0 0
0 0 1 1
0 1 0 1
0 1 1 1
1 0 0 1
1 0 1 1
1 1 0 1
1 1 1 1
From 0xFE
Change To
From 0x01

Figure 22

280

```
LogicOutVal LogicTbl1Func(LogicInVal*  pInputValArray,LogicID OutputID)
{
LogicOutVal RetVal=NoSetting;              /* at application layer, do not set any value */
            if((pInputValArray[0]==ON)&&     /*LSMA_VEH_SPEED_Zero==ON */
              ((pInputValArray[1]==ON)||    /*LSMA_RKE_Decklid_IN==ON or*/
              (pInputValArray[2]==ON)))     /*LSMA_Decklis_Rel_IN==ON*/
              {
                 ActivateDelOut(LSMA_Trunk_Release_idx,T960MS);
              };
            return RetVal;
};

const FuncTbl3In AppTbl1=
{
            FuncTbl,                              /* table type is function table */
            InputNum3,
            LSMA_Decklis_Rel_IN,                  /* 3rd */
            LSMA_RKE_Decklid_IN,                  /* 2nd */
            LSMA_VEH_SPEED_Zero,                  /* 1st lowest bit position  */
            LSMA_TrunkRelease,                    /* Output ID */
            LogicTbl1Func,                        /* logical function address */
};
```

Figure 23

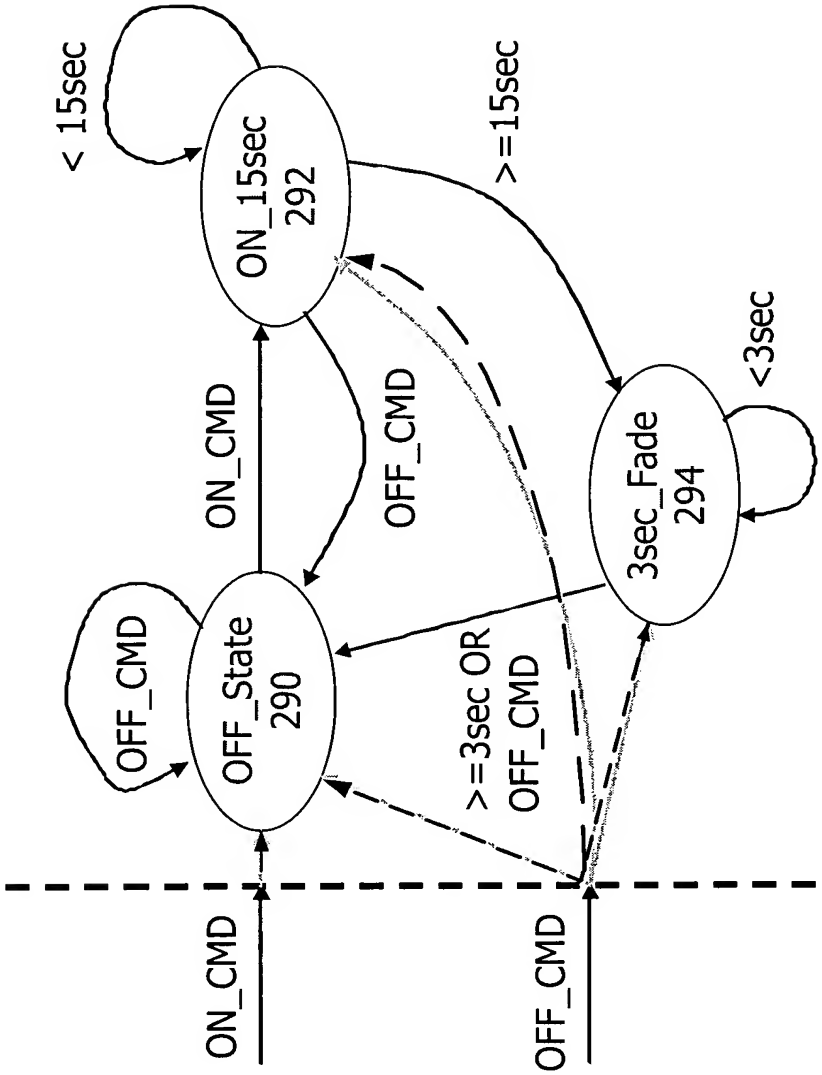

< 15sec
ON_15sec
292
>=15sec
ON_CMD
OFF_CMD
<3sec
3sec_Fade
294
OFF_CMD
OFF_State
290
>=3sec OR
OFF_CMD
ON_CMD
OFF_CMD

Figure 24

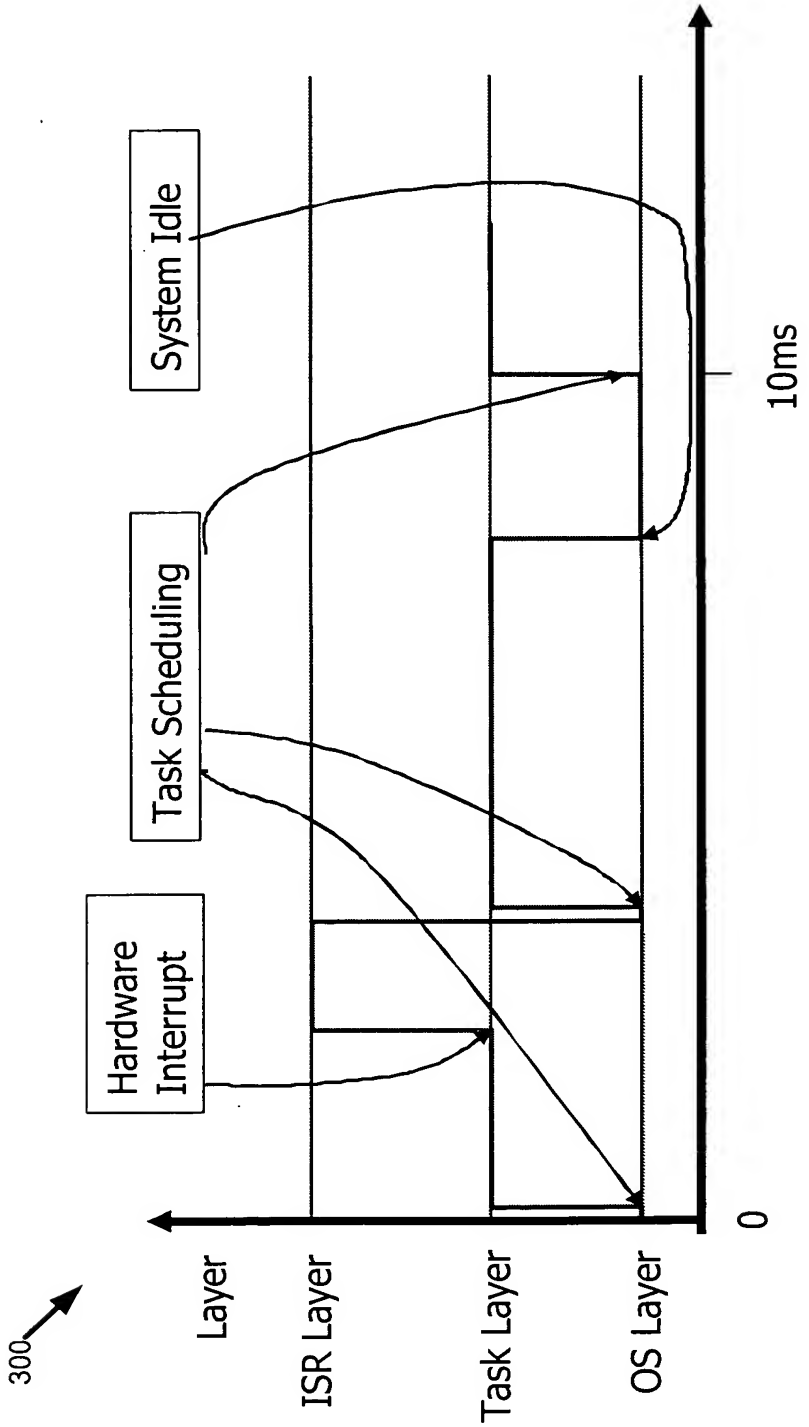

300
Layer
ISR Layer
Task Layer
OS Layer
0
10ms
Hardware Interrupt
Task Scheduling
System Idle

Figure 25

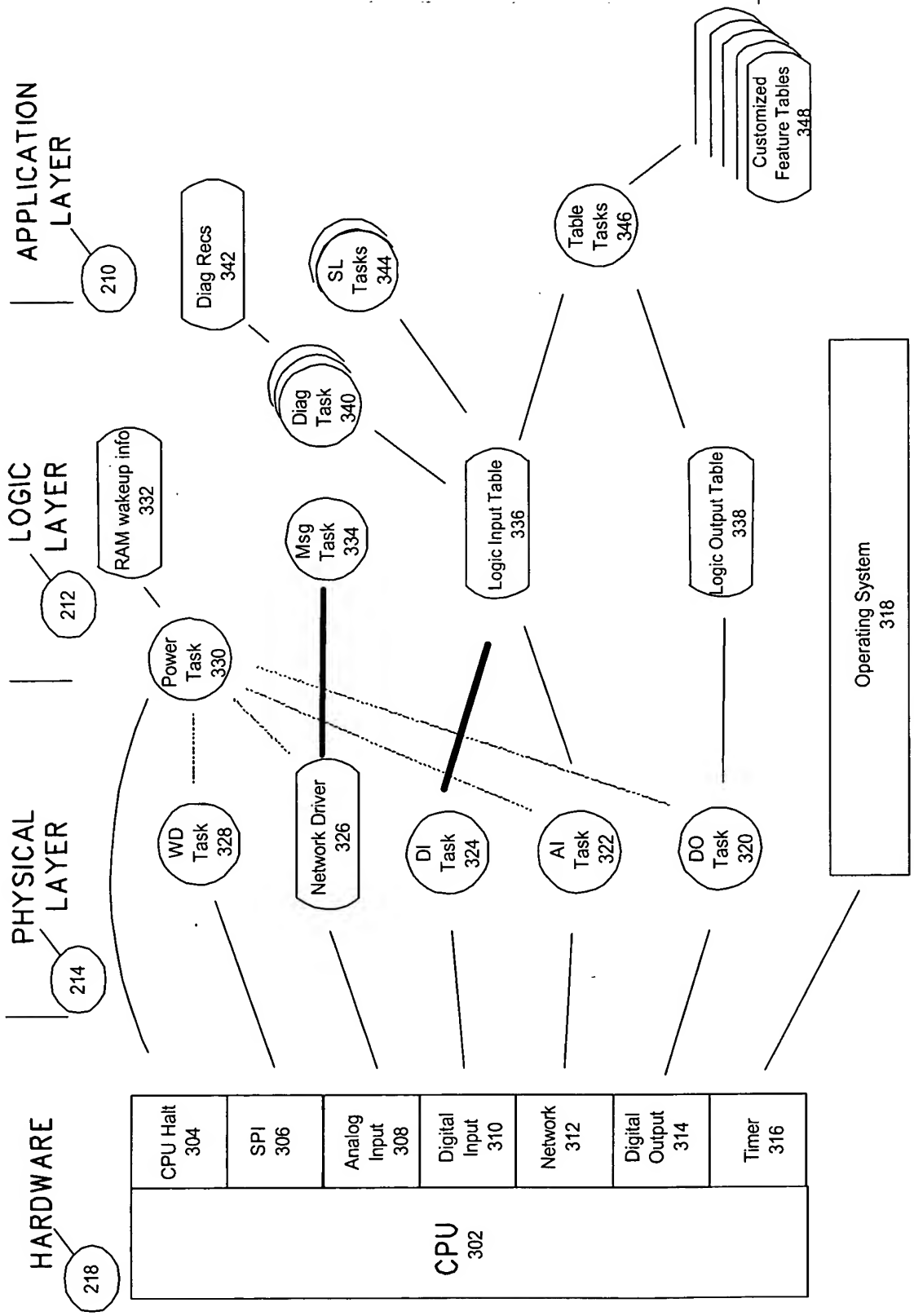

APPLICATION LAYER
210
LOGIC LAYER
212
PHYSICAL LAYER
214
HARDWARE
218
Diag Recs 342
SL Tasks 344
Table Tasks 346
Customized Feature Tables 348
Diag Task 340
RAM wakeup info 332
Msg Task 334
Logic Input Table 336
Logic Output Table 338
Power Task 330
Operating System 318
WD Task 328
Network Driver 326
DI Task 324
AI Task 322
DO Task 320
CPU Halt 304
SPI 306
Analog Input 308
Digital Input 310
Network 312
Digital Output 314
Timer 316
CPU 302

Figure 26

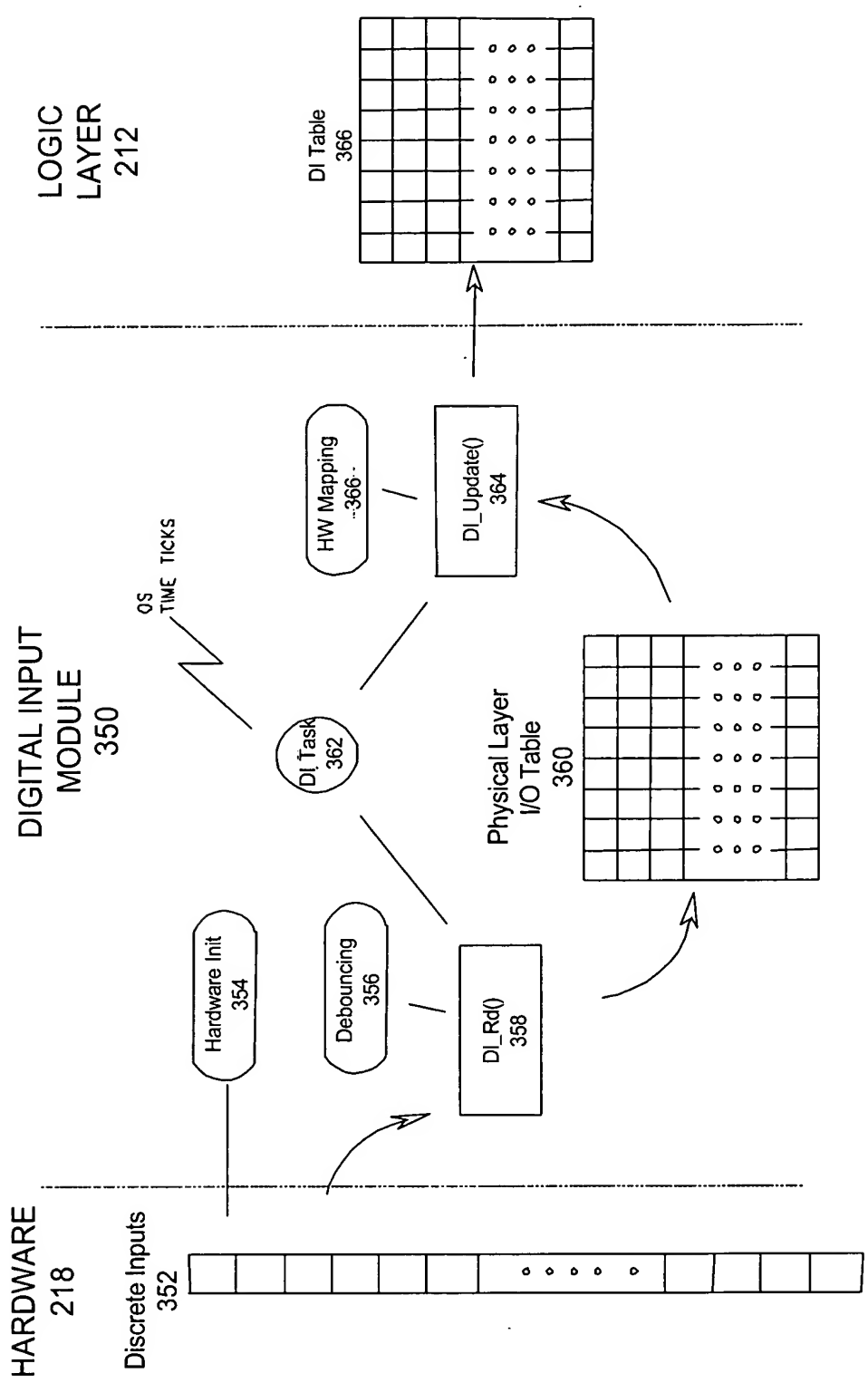

LOGIC LAYER 212
DI Table 366
HW Mapping 366
DI_Update() 364
OS TIME TICKS
DIGITAL INPUT MODULE 350
DI Task 362
Physical Layer I/O Table 360
Hardware Init 354
Debouncing 356
DI_Rd() 358
HARDWARE 218
Discrete Inputs 352

Figure 27

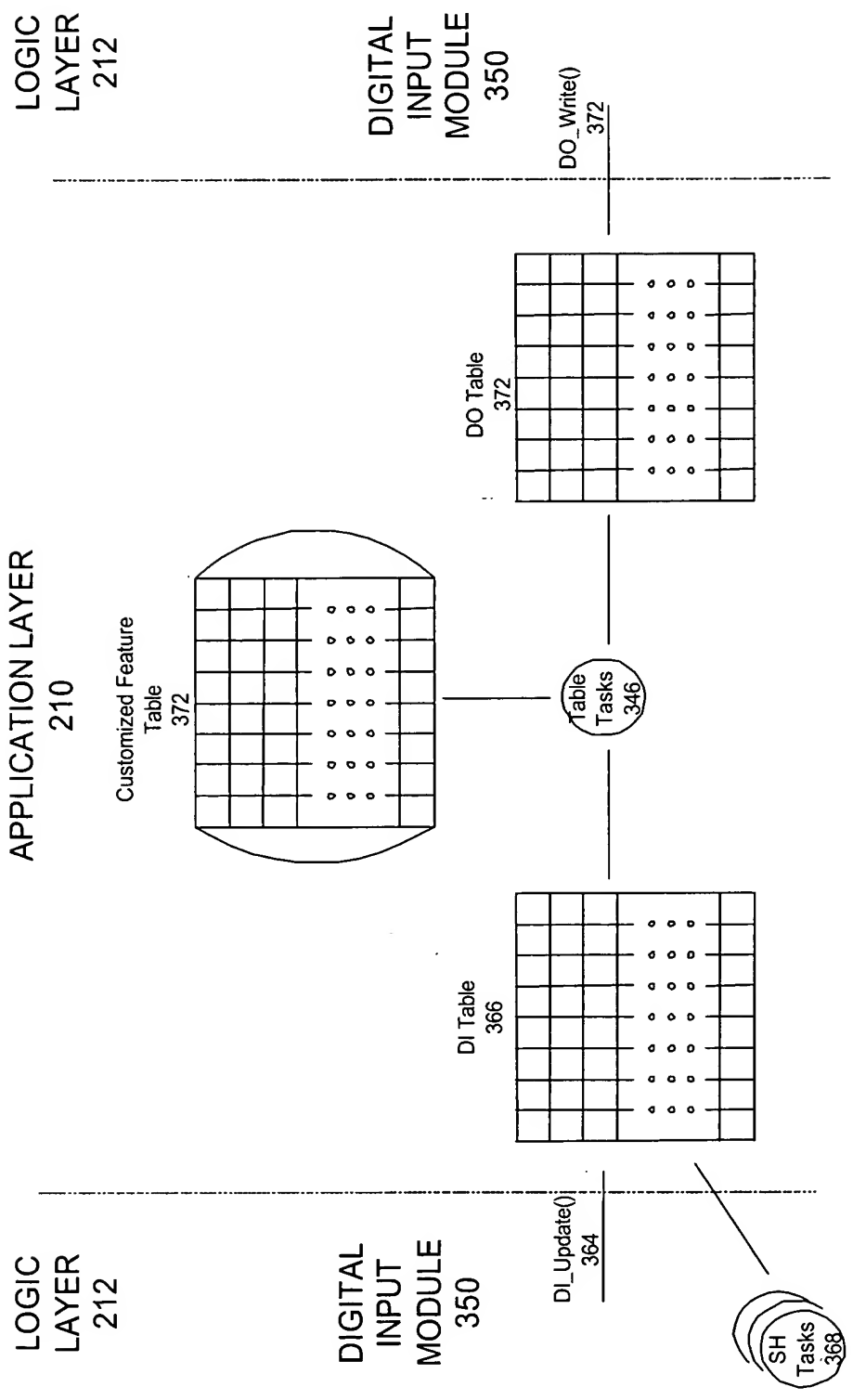

LOGIC LAYER 212
DIGITAL INPUT MODULE 350
DO_Write() 372
DO Table 372
APPLICATION LAYER 210
Customized Feature Table 372
Table Tasks 346
DI Table 366
LOGIC LAYER 212
DIGITAL INPUT MODULE 350
DI_Update() 364
SH Tasks 368

Figure 28

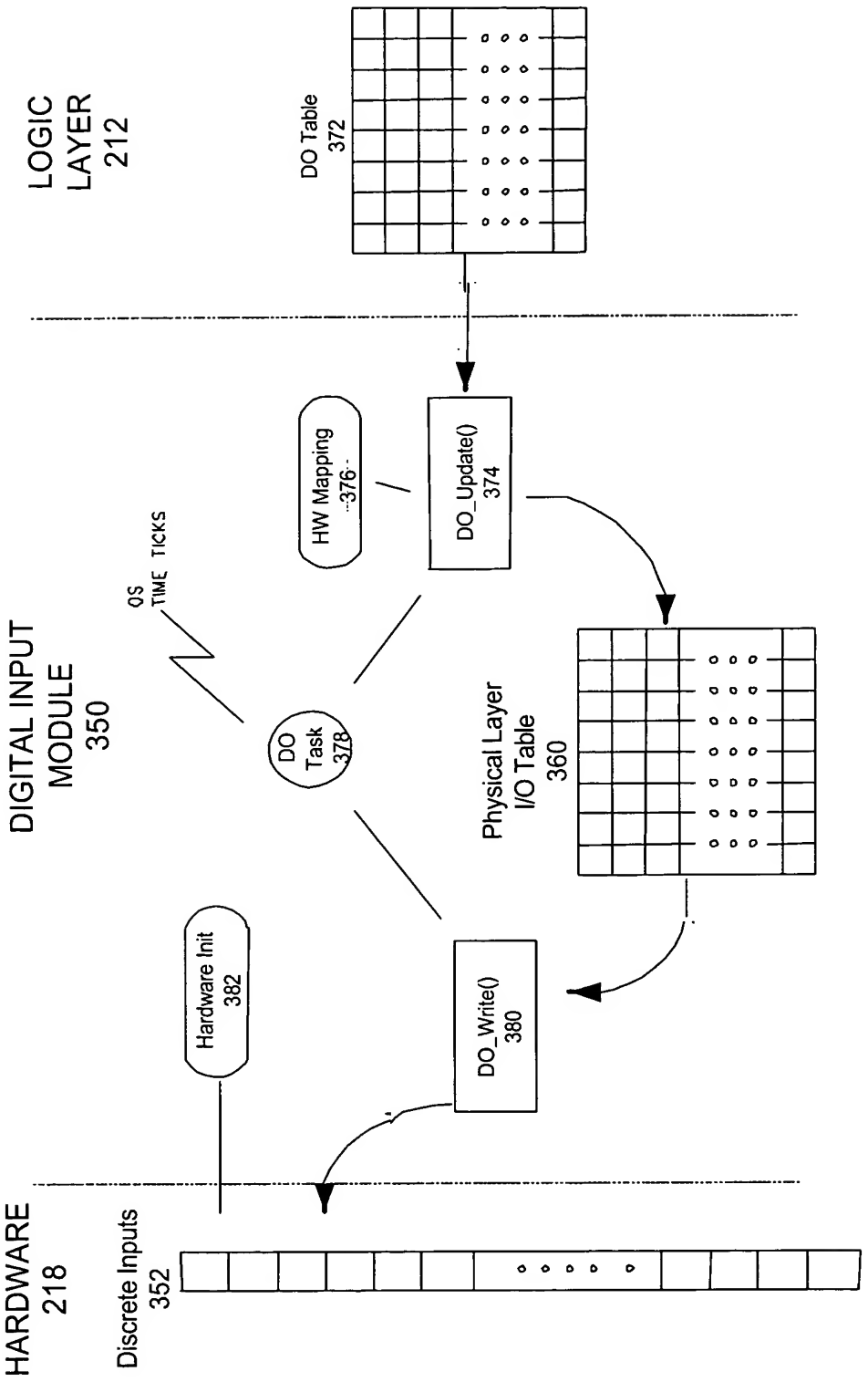

LOGIC LAYER 212
DO Table 372
HW Mapping 376
DO_Update() 374
OS TIME TICKS
DIGITAL INPUT MODULE 350
DO Task 378
Physical Layer I/O Table 360
Hardware Init 382
DO_Write() 380
HARDWARE 218
Discrete Inputs 352

Figure 29